

# The effect of training on students regarding the prevention of Brucellosis

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## Abstract

**Introduction:** Brucellosis is one of the most common zoonotic diseases that is especially important for its side effects on human in terms of health and economy. It appears that an important reason for the incidence of brucellosis and its consequent disabilities is lack of knowledge about its transmission routes and prevention. Hence, the present study aimed to determine the effect of training on the knowledge of Shahr-e Babak Azad University students about the prevention of brucellosis.

**Methods:** This experimental study was conducted with 108 students assigned to the experimental and control groups by random stratified sampling from Shahr-e Babak Azad University in 2013. First, students' knowledge of brucellosis and its prevention was assessed using a valid and reliable researcher-made questionnaire. Then a training program including two sessions of group training, questions and answers, and discussion was implemented and an educational pamphlet was distributed among the experimental group. One month later, the post-test was given. Data were analyzed using descriptive and inferential statistics in SPSS software.

**Results:** Knowledge score of students before the intervention was not significantly different in the experimental and control groups, while the difference of mean score was significant after the intervention. None of the demographic variables had a significant impact on the mean score of knowledge after training. The significance level was set at  $P < 0.05$  for all tests.

**Conclusion:** The results showed that training can improve participants' knowledge about brucellosis prevention. Training is an appropriate and necessary method to increase health information.

**Keywords:** Training, Prevention, Brucellosis

## Introduction

Brucellosis is one of the most important and prevalent zoonotic diseases, causing death of a lot of people each year (1). Brucellosis is observed in many countries, and is prevalent in Eastern Mediterranean region, the Middle East. In the United States of America, it is considered an occupational hazard while in Iran; brucellosis is not limited to a certain occupation (2). What highlights brucellosis in Iran is its epidemiology, its use for agriculture, livestock raising, and people's rustic and nomadic lives are intertwined, and non-pasteurized dairy products are popular in cities (3). According to the Ministry of Health report, the incidence of brucellosis was 193 and 572 per 100,000 people in 2001 and 2006, respectively (4). It appears that, prevention is the most important step in controlling the disease. Breaking the chain of transmission to

human is dependent on complying with health principles. Interdisciplinary coordination and community training are the major strategies to control and prevent this disease (5). Human is infected through using contaminated dairy products, direct contact with animal's fluids or eating contaminated animal's meat (6). Eini *et al* studied people with brucellosis in Hamedan province and reported fever, arthralgia, sweating, and lethargy as the most common symptoms. Furthermore, the most common route of transmission was using non-pasteurized dairy products (7). This disease is known as a disease with a thousand faces because of its lasting complications; therefore, it can have a significant impact on the quality of life for the infected people. Moreover, this disease mostly infects the active population of a community (15-40 years old), therefore, it can cause further damage through incurring



treatment costs, troubling production and economical activities, and inflicting the efficient forces in the society (8). A study by Mangolian on the knowledge of high school students in Shahr-e Babak showed that most subjects had poor knowledge of preventing and controlling of brucellosis (9). According to Almasi-Hashiani *et al.*, a reason for patients' late visit to health centers and the consequent side effects and disabilities is their lack of knowledge (10). Shahr-e Babak, a husbandry core in Kerman province, is endemic for human brucellosis, according to reports; it has not been controlled efficiently. Therefore, prevention requires knowledge about the disease. Students have a significant role in informing their family and community, so the present study was designed to study the effect of training on students' knowledge in order to prevent brucellosis in Azad University of Shahr-e Babak.

## Methods

This experimental study was conducted in Azad University of Shahr-e Babak in 2013. The study population included the students of Azad University in Shahr-e Babak with these inclusion criteria: the complete orientation and no history of previous or simultaneous official training about the study subject. Similar studies were used to determine the sample size with the CI 95% and power of 80. Considering the possible dropouts, 54 students were recruited for each of the experimental and control groups.

Because the number of students in the study population was much higher than the required sample, stratified sampling was used to select a proportionate number of students from each major, and 64 students (60%) were selected from engineering majors, 27 students (25%) from paraclinic and veterinary majors, and 17 students (15%) from humanities. They were assigned [randomly] to experimental and control groups. Data collection tool was a researcher-made questionnaire which was validated using content validity. Books and journals were studied and based on the objectives of the study, the items were extracted for the questionnaire, which was given to faculty members and experts, and their comments and recommendations were implemented to finalize the tool. The reliability of the tool was assessed by test-retest; it was given to 20 students with a 10-day interval and the correlation between the two tests was confirmed ( $r=0.85$ ). The questionnaire had two parts: the first part had 8 items for demographic information of students; the second part had 20 multiple choice items about brucellosis, its transmission routes and prevention. Each correct answer scored one and each incorrect answer scored zero. The researcher obtained a recommendation letter and coordinated with education department and deans of department to randomly select the subjects. Then, the subjects gave consent to participate and they were interviewed in a quiet place and at an appropriate time. They were briefed on the objectives of the study and then they filled out the questionnaire to assess their knowledge on brucellosis, its trans-

mission routes and prevention. Next, training sessions were held for the experimental group. Training consisted of an organized plan for a combination of group training (3 groups of 18 people each), questions and answers session, discussion and training pamphlet in two sessions of 25 to 30 minutes for each group at the time they were ready at a quiet place by the researcher. The education material included information about brucellosis, its transmission routes and prevention. Finally, a pamphlet was given to students. The content was developed by reading the latest books and papers, and consulting with expert faculty members. In the next stage, one month after the training course in the experimental group and one month after the pretest in the control group, a retest was given to assess the efficacy of training. To observe ethical considerations, the case group received the same training course and the same pamphlet at the end of the study. All stages of the study were conducted by the researcher in order to increase the accuracy of the study. SPSS software was used to analyze the data. Demographic data were analyzed by absolute and relative frequency. The amount of knowledge about the prevention of brucellosis before and after the intervention was assessed using paired T-test within the groups and independent T-test between the groups. Chi-square test and independent T-test were used to match the variables in both groups. Pearson's correlation test and T-test were used to investigate the correlation between the variables. Linear regression analysis was used to determine the effect of demographic variables on training. Significance level was set at  $P<0.05$ .

## Results

All the questionnaires were returned in this study. First the demographic data were checked in both groups, and they were matched for all variables. Furthermore, independent T-test did not show a significant difference between the two groups in terms of their knowledge about brucellosis ( $P<0.5$ ).

Analysis of the data showed that mean score of students' knowledge about the prevention of brucellosis was  $7\pm2.9$  in the experimental group before the intervention and increased to  $18.6\pm1.7$  after training. This difference was significant using paired T-test ( $P<0.001$ ). Meanwhile, the mean score of students' knowledge was  $6.6\pm2.8$  in the pretest, and  $6.98\pm2.8$  in the post-test. Paired t-test showed no significant difference between the two groups ( $P=0.16$ ). Furthermore, the comparison of changes in the two groups using independent t-test showed a significant difference between the two groups before and after training in terms of their knowledge ( $P<0.0001$ ) (Table 1). Furthermore, score of knowledge was positively and moderately correlated with age using Pearson's correlation coefficient ( $r=0.43$ ,  $P=0.27$ ). ANOVA and independent t-tests showed that other demographic variables had no significant effect on knowledge score after training ( $P>0.05$ ) (Table 2).

**Table 1.** Mean and standard deviation of knowledge score about preventing brucellosis and its changes in different studied groups

Knowledge	Group						Intragroup test result
	Before intervention	Experimental After intervention	Intragroup results	First test	Case Second test	Intragroup results	
Knowledge about preventing brucellosis	7±2.9	18.6±1.7	P<0.0001*	6.6±2.8	6.96±2.8	P=0.16	P<0.0001**

\* Paired samples T-test

\*\* Independent samples T-test

**Table 2.** Absolute and relative frequency of demographic variables and their effect on mean score of knowledge after training

Variable		Number	%	P
Gender	Male	74	70	P=0.72*
	Female	32	30	
Father's occupation	Employee	51	47.7	P=0.7**
	Worker and self- employed	27	25.2	
	Farmer and livestock raiser	28	26.2	
Mother's occupation	Employed	15	14	P=0.68
	Unemployed	91	85	
Father's education	Illiterate	6	5.6	P=0.3**
	Middle school	28	26.2	
	High school diploid	39	36.4	
	Higher education	33	30.8	
Mother's education	Illiterate	15	14	P=0.46**
	Middle school	35	32.7	
	High school diploma	43	40.2	
	Higher education	13	12.1	
Major	Engineering	64	60	P=0.62**
	Paraclic and veterinary	27	25	
	Humanities	17	15	

Age (23±4 years, Pearson's correlation= 0.43)

\* Independent samples T-test

\*\* One-way ANOVA

## Discussion

The results of the present study showed that training programs increase students' knowledge. Scholars believe that training leads to acquiring new knowledge or skill (11,12). Furthermore, the results showed that the mean score of knowledge significantly increased in the experimental group in comparison to the case group. Liu *et al* from China showed that training different occupations involved in brucellosis was significantly effective (13). Mazloomi Mahmoodabad *et al* in their study on the effect of training on 14- to 16-year-old students in Yazd showed that students' knowledge was significantly higher 3 months after training. Additionally, their health behaviors were improved as well (14). This finding confirms the fact that the first step in observing health principles is knowledge. In order to have proper health behaviors, we need to have proper knowledge about those behaviors because it is not possible to improve behavior and practice without proper knowledge of the behaviors and their importance (15). In this regard, Karimi *et al* concluded that training was effective in improving beliefs and practices of mothers regarding the prevention of brucellosis. They observed a significant positive relationship between knowledge and preven-

tive behavior ( $P<0.0001$ ,  $r=0.25$ ), and between perceived threat and preventive behavior ( $P<0.0001$ ,  $r=0.41$ ) (16). The results of a similar study titled 'The effect of training program on preventive behaviors for brucellosis in villagers' by Oruoji *et al* in Khomein in 2012 showed that the mean score of knowledge and practice significantly increased immediately and 2 months after the educational intervention (17). The researcher believes that increased knowledge is an incentive to comply with health principles and reduce the prevalence of diseases. According to Barak *et al*, conducting training programs and raising awareness about brucellosis in Meshkinshahr city reduced the incidence of brucellosis from 25 per 100,000 to 16 per 100,000 in a year (18).

The results of the present study showed that the mean score of knowledge was  $2.9\pm6.8$  in the experimental and the case group before training. It can be concluded that students' knowledge about preventing brucellosis was little before training, which is an evidence for the necessity of training in this regard. Bani in a similar study, showed that an important educational need in developing countries in all levels is knowledge about diseases and health principles (19).

Nevertheless, the results indicated that major had no effect on the score of knowledge. Given that our subjects included paraclinic and veterinary students, it is important to note that they are healthcare providers in future and it is expected to have good knowledge about zoonotic diseases. This finding concurs with that of John *et al* study in Tanzania, where they concluded that knowledge of the study subjects including healthcare staff was not good about causes, signs, and diagnostic methods of zoonotic diseases (20). Jiang *et al* recommended training programs especially in endemic regions, schools, and universities as a solution for their lack of knowledge (21). Kisman *et al.* in their study in Cyril University, concluded that the most important standards and international strategies to monitor, control, and prevent brucellosis are interdisciplinary cooperation, educational programs and exchange of information (22). Numerous studies in Iran have confirmed and emphasized that training at different levels is one of the most important methods to prevent brucellosis because knowledge about a disease leads to developing healthy behaviors. Based on the study results, none of the studied variables had a significant effect on the score of knowledge. It is inferred that changes in knowledge occur directly under the influence of training. Saif believes that the best education is the one that is not affected by confounding factors (23). Based on our findings, it seems that training and institutionalizing health in scientific environments like universities can have an important effect on increasing students' knowledge and the importance of their role in exchanging information and improving health of the family and the community. In line with the main objective of the study, that is explaining the effect of training on students' knowledge about preventing brucellosis, the findings of the present study showed that the mean score of the experimental group was significantly higher after training as compared with the control group. Therefore, the null hypothesis is rejected, that is, training is effective on university students' knowledge about preventing brucellosis. The researcher believes that if training is performed in an appropriate environment, and by developing the attitude, it can lead to better results. Furthermore, presenting the information in an understandable manner, based on their needs and using group training and questions and answers can also be effective. Given the above-mentioned, it appears that training health with a focus on increasing knowledge can provide the opportunity for people to prevent diseases at primary levels that leads to better quality of life for them (24).

The researcher faced some limitations in conducting the study. Certain personal differences of students affected their learning capacity, which was out of the researcher's control.

Given the efficacy of training on students' knowledge about preventing brucellosis, it is recommended that educational planners use modern methods in teaching health.

Furthermore, it is recommended that extensive educational courses be held for students in order to improve health.

## Conclusion

Given the effect of training program, it appears that preventing infectious diseases, and training the public especially students who can influence their family and community are essential. It is hoped that the results of the present study be used for education, management, and nursing research.

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## Ethical issues

This study was done after approval by the ethic committee of Islamic Azad University of Shahrabak.

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